

Ecological Restoration of the Plaster Creek Watershed

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Introduction

The Plaster Creek watershed is the area of land starting in Dutton and stretching to south Grand Rapids that drains to Plaster Creek. Historically, Plaster Creek was a natural beauty and even an area of high spirituality for the Native Americans. However, over the past one hundred years Plaster Creek has become extremely polluted and neglected.

Main Threats

The main threats that face the creek now come from the diverse land use throughout the watershed. Within the watershed there is agricultural land, residential land, and commercial use land. This leads to five types of major pollution in the watershed: sediment, bacterial contamination, nutrient pollution, thermal pollution, and toxic contamination.

All of the pollution problems are enhanced during a large rain. When it rains in the watershed, all the pollution sources collect on impermeable surfaces and run straight into the creek.

Stewardship

Because Calvin is situated within the watershed and 50% of the students, faculty, and staff reside within the watershed, we are responsible to seek restoration for this once beautiful stream. Plaster Creek Stewards, a community outreach initiative out of Calvin College, has begun to focus on the control of rainwater runoff to help lower the effect of these pollutants on the creek.

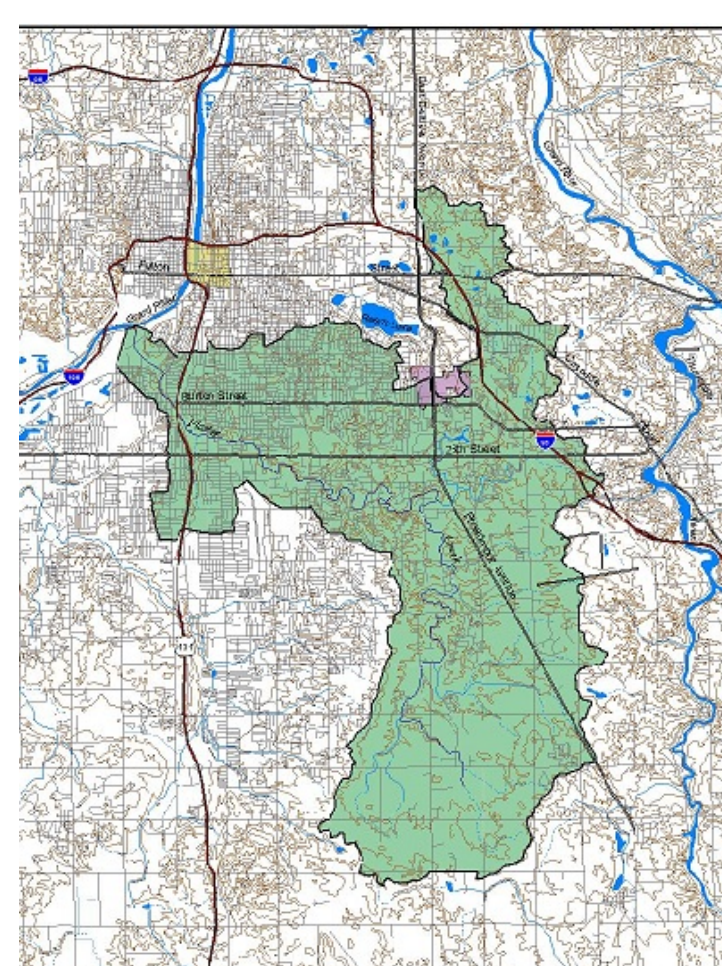


Figure 1- Map of the Plaster Creek watershed, Grand Rapids, MI

Methods

We built curb cut gardens in the parkways between the road and the sidewalk in front of homes in the Alger Heights neighborhood, and cut the curb to allow water to flow from the street into the garden.

Selecting Locations for Gardens

We work with residents of the area and select the houses of people who want the gardens and the houses that can hold the most water. Because the parkway is city owned property, each location has to be approved. To be approved the parkway needs to be able to hold an adequate volume of rain runoff for the area. In addition, the soil needs to be sandy so that water can drain quickly.

Building New Gardens

Once the parkway is approved, it is excavated, and then we add compost and shape the land to form a basin, filling the basin with rocks. Around the rock basin, we design a garden full of salt-tolerant plants that are native to the Grand Rapids area. These plants are more deep-rooted than non-native and invasive species, allowing storm water to be filtered and absorbed more efficiently. These native species also promote native biodiversity in more urban environments. We lay mulch among the plants to reduce the spread of weeds within the gardens.

Along with building new rain gardens, we monitor and maintain old gardens, transplant young seedlings into plug flats to prepare them to be planted in rain gardens, and create digital maps of the rain gardens we plant so that homeowners can have a guide to help them care for their new rain garden.



Figure- The cut curb of a mature rain garden in the Alger Heights neighborhood

Objectives

- To reduce the volume of contaminated water by building rain gardens in the Alger Heights neighborhood
- To restore native plant habitat and increase biodiversity in the Plaster Creek Watershed.
- To encourage anew aesthetic so more homeowners plant native gardens rather than shallow-rooted lawns.

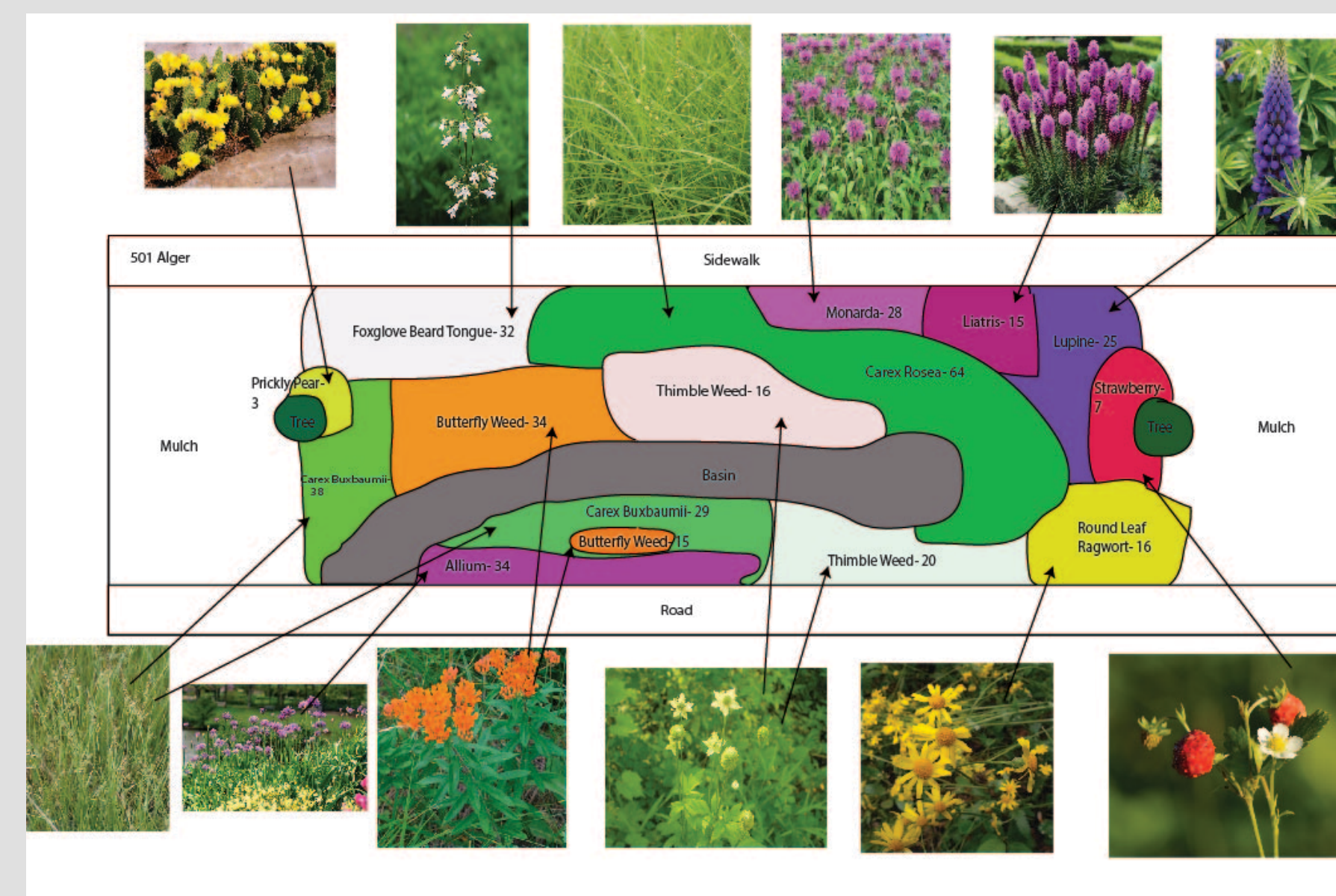


Figure 3- Digital map of a rain garden. Homeowners are given maps of their gardens to explain the different plant species found there. We also use the maps to track survivorship of our gardens.

Results

While it is estimated that it will be years until we can see measurable change in the water quality in the Plaster Creek watershed, we were able to complete 11 new curb cut rain gardens so far this summer, and have cleared buckets full of sediment in old rain gardens which otherwise would have further contaminated the creek. We also have established valuable connections with community members, and have been flooded with requests for new curb cut rain gardens to be installed. There is a new grant that will cover an additional 40 curb cut rain gardens in the Alger Heights and Oakdale neighborhoods.



Figure 4- A newly planted rain garden. Once established, this garden will collect large volumes of storm water.

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